

What is claimed is:

1. A method for an optical recording device to background format an optical recording medium, the optical recording medium comprising a plurality of defect management areas (DMAs) arranged sequentially, each of the DMAs comprising a data area (DA) and a spare area (SA), each of the DAs and each of the SAs comprising a plurality of packets to record digital data, each of the packets comprising a plurality of blocks, each block having a corresponding address for distinguishing, the background formatting method comprising the following steps:
 - (A) establishing a format recording table and storing the format recording table in a memory in the optical recording device, the format recording table comprising a plurality of recording units to record whether the packets in the DMAs are recorded with digital data;
 - (B) when formatting a certain packet in the optical recording medium by a predetermined formatting process, inspecting the corresponding recording unit in the format recording table; if the corresponding recording unit indicates that there is no digital data in the current packet, starting formatting, otherwise skipping the current packet and formatting the next packet; and
 - (C) repeating step (B) for all the packets in the optical recording medium.
2. The background formatting method of claim 1, wherein the optical recording device receives a computer command from a host computer, and the optical recording device operates according to the content of the computer command.
3. The background formatting method of claim 2, wherein the computer command is chosen from one of the following commands: a formatting command, a data writing command and a data reading command.
4. The background formatting method of claim 3, wherein the optical recording

device comprises an optical pickup head to read/record data in the optical recording medium, and the predetermined formatting process is performed by the optical pickup head writing a formatted information in the packet designated to format in the optical recording medium for identifying.

- 5 5. The background formatting method of claim 4, wherein when the host computer transmits a formatting command to the optical recording device, the optical recording device performs only a necessary preliminary formatting procedure and then transmits a receiving message to inform the host computer that the formatting command has completely executed.
- 10 6. The background formatting method of claim 5, wherein the optical recording medium comprises a main table area (MTA), a pre-gap and a general application area (GAA), the necessary preliminary formatting procedure formatting only the MTA, the pre-gap and the GAA to the optical recording medium.
- 15 7. The background formatting method of claim 5, wherein after transmitting the receiving message to the host computer, the optical recording device proceeds with the step (A), step (B) and step (C) in the background formatting method to finish formatting the optical recording medium.
8. The background formatting method of claim 7, wherein every recording unit of the format recording table corresponds one by one to a packet in a DMA.
- 20 9. The background formatting method of claim 8, wherein before formatting the optical recording medium is completed, if the host computer transmits the data writing command to the optical recording device, the optical recording device will record the digital data in the corresponding packet, according to the address in the data writing command, in the optical recording medium and record an information
- 25 that the packet already has digital data on the corresponding recording unit in the format recording table.

10. The background formatting method of claim 7, wherein before formatting the optical recording medium is finished, if the host computer transmits the data reading command to the optical recording device, the optical recording device inspects the corresponding recording unit, according to the address in the data reading command, to judge whether the packet in the optical recording medium has not been formatted and not recorded any digital data, then transmits the formatted message to the host computer after judged that the packet has not been formatted and not recorded.
11. The background formatting method of claim 10, wherein when the optical recording device receives the data reading command, if the packet in the optical recording medium is confirmed as not formatted and not recorded with any digital data, the optical recording device will not drive the optical recording device to read data and will directly transmit the formatted message to the host computer.
12. The background formatting method of claim 1, wherein the memory comprises a plurality of memory units numbered sequentially, the recording units in the format recording table correspond to some memory units stored in the memory.
13. The background formatting method of claim 12, wherein each of the recording units stores a writing flag to show whether the corresponding packet has recorded digital data.
14. The background formatting method of claim 13, wherein the memory capacity of each recording unit is one bit; the writing flag with 0 means the corresponding block records no digital data, while the writing flag with 1 means the corresponding block records digital data.
15. The background formatting method of claim 13, wherein the memory capacity of each recording unit is two bits; the writing flag with 00 means the corresponding block is not formatted and not recorded digital data, the writing flag

with 01 means the corresponding block records digital data, while the writing flag with 10 means the corresponding block is formatted.

16. The background formatting method of claim 1, wherein after the optical recording device has background formatted the whole optical recording medium, the optical recording device deletes the format recording table from the memory to release the memory capacity.
17. The background formatting method of claim 1, wherein the memory is a DRAM.
18. The background formatting method of claim 1, wherein the optical recording medium is a CD-RW (Compact Disk ReWritable) or a DVD+RW (Digital Versatile Disk plus ReWritable).
19. A system for an optical recording device to background format an optical recording medium, the optical recording medium comprising a plurality of defect management areas (DMAs) arranged sequentially, each of the DMA comprising a data area (DA) and a spare area (SA), each of the DAs and each of the SAs comprising a plurality of packets to record digital data, each of the packets comprising a plurality of blocks, each block having a corresponding address for distinguishing, the background formatting system comprising the following elements:
- a format recording table, which is stored in a memory in the optical recording device, comprising a plurality of recording units to record information about whether the packets in the DMAs are recorded digital data;
 - an inspecting and judging module, used for inspecting the corresponding recording unit in the format recording table, when formatting a certain packet by a predetermined formatting process in the optical recording medium;

a formatting/recording module, if the corresponding recording unit indicates that there is no digital data in the current packet, starting formatting by the predetermined formatting process, otherwise skipping the current packet and formatting the next packet.

- 5 20. The background formatting system of claim 19, wherein the optical recording device receives a computer command from a host computer, and operates according to the content of the computer command.
21. The background formatting system of claim 20, wherein the content of the computer command is chosen from one of the following commands: a formatting
10 command, a data writing command and a data reading command.
22. The background formatting system of claim 19, wherein the predetermined formatting process is that the formatting/recording module writes a formatted information in the packet designated to format in the optical recording medium for identifying.
- 15 23. The background formatting system of claim 21, wherein when the host computer transmits a formatting command to the optical recording device, the optical recording device performs only a necessary preliminary formatting procedure and then transmits a receiving message to inform the host computer that the formatting command has completely executed.
- 20 24. The background formatting system of claim 23, wherein the optical recording medium comprises a main table area (MTA), a pre-gap and a general application area (GAA), the necessary preliminary formatting procedure formatting only the MTA, the pre-gap and the GAA to the optical recording medium.
- 25 25. The background formatting system of claim 23, wherein after the optical recording device transmits the receiving message to the host computer, the formatting/recording module and the inspecting and judging module proceed with

the background formatting process to finish formatting the optical recording medium.

26. The background formatting system of claim 19, wherein every recording unit of the format recording table corresponds one by one to a packet in a DMA.

5 27. The background formatting system of claim 21, wherein before finishing formatting the optical recording medium, if the host computer transmits the data writing command to the optical recording device, the formatting/recording module will record the digital data in the corresponding packet in the optical recording medium according to the address in the data writing command, and records an
10 information in the corresponding recording unit of the format recording table that the packet already has digital data.

28. The background formatting system of claim 27, wherein before finishing formatting the optical recording medium, if the host computer transmits the data reading command to the optical recording device, the inspecting and judging
15 module will inspect the recording unit, according to the address in the data reading command, to judge whether the packet in the optical recording medium is not formatted and not recorded any digital data, then transmit the formatted message to the host computer after judged that the packet has not been formatted and not recorded.

20 29. The background formatting system of claim 28, wherein when the optical recording device receives the data reading command, if the packet in the optical recording medium is not formatted and not record any digital data after judgment, the optical recording device does not read the packet and directly transmits the formatted message to the host computer.

25 30. The background formatting system of claim 19, wherein the memory comprises a plurality of memory units numbered sequentially, the recording units in the

format recording table correspond to some memory units stored in the memory.

31. The background formatting system of claim 30, wherein every recording unit stores a writing flag to show whether the corresponding packet has recorded digital data.
- 5 32. The background formatting system of claim 19, wherein after the optical recording device has background formatted the whole optical recording medium, the optical recording device deletes the format recording table from the memory to release the memory capacity.
- 10 33. The background formatting system of claim 19, wherein the memory is a DRAM.
34. The background formatting system of claim 19, wherein the optical recording medium is a CD-RW or a DVD+RW.